



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/620,910

07/15/2003

David Champion

200208821-1

8961

22879

7590

11/26/2007

HEWLETT PACKARD COMPANY

P O BOX 272400, 3404 E. HARMONY ROAD

INTELLECTUAL PROPERTY ADMINISTRATION

FORT COLLINS, CO 80527-2400

EXAMINER

LEE, CYNTHIA K

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

11/26/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/620,910

Applicant(s)

CHAMPION, DAVID

Examiner

Cynthia Lee

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4,6-19,21-23 and 43-45 is/are pending in the application.
- 4a) Of the above claim(s) 3,4,17,43 and 45 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,6-16,18,19,21-23 and 44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

In view of the Appeal Brief filed on 8/24/2007, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:



This Office Action is responsive to the Appeal Brief filed on 8/24/2007. Claims 1-4, 6-19, 21-23, and 43-45 are pending. Claims 3, 4, 17, 43, and 45 are withdrawn from further consideration as being drawn to a non-elected invention. After further consideration:

The 35 USC 101 rejection has been withdrawn.

The 35 USC 112, 1<sup>st</sup> paragraph rejection has been withdrawn.

In the Office Action mailed 3/20/2007, not all claims were rejected under prior art. Claims 1, 2, 6-16, 18, 19, 21-23, and 44 are non-finally rejected.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 2, 6-13, 19 and 21-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 19 state "a housing having an outer region, an inner region...". The Examiner notes that through the entire Specification, the inner and outer regions are referred to the fuel cell assembly, and not the housing. Thus, this limitation is unclear.

The limitation "an inner region defining a perimeter and exhaust port connected to the inner region" is unclear. If the inner region refers to the housing, it is unclear as to the structural relationship between the housing and a perimeter. Further, the limitation "perimeter" is unclear, perimeter of what?

The means plus function language in claim 19 is unclear as to which embodiment in the Specification it refers to. It is noted that the Specification does not support the means plus function language to specify which embodiment it refers to. It is also unclear what structure disclosed in the specification is encompassed by the means plus function language.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 6-16, 18, and 44 are rejected under 35 U.S.C. 102(b) as being anticipated by Montemayor (US 6063517).

Montemayor discloses a spiral-shaped fuel cell assembly with an outer casing. The MEA is wound several times to form a spiral bundle from the periphery of the housing to the center. The reactant path follows the spiral bundle that extends around the perimeter. The hydrogen gas enters and exits from the hydrogen injection tubes located in the periphery and the center of the fuel cell assembly. The MEA winds around the hydrogen injection tube 24 (fig. 2) at least once around the perimeter. The oxidant inlet is also associated with the outer region of the housing. (See fig. 2 and 3 and 2:25-39 and 5:13-45) The fuel path is adjacent to the anode. Refer to Fig. 1. The catalyst layer 16 or 18 is adjacent to the anode layer 14. The catalyst layers are made of carbon support layer on a membrane or carbon cloth (2:46-52). The fuel path (applicant's empty space) extends in a radial direction from one electrode to another (applicant's claim 1) as the spiral wraps multiple times. The Examiner notes that the claim does not structurally define the boundaries of the "empty space." The limitation "to a radially spaced electrode surface" (emphasis added) does not define the boundaries of the "empty space."

Montemayor discloses that the anode/cathode arrangement has a spiral shape that extends more than once around the perimeter of the exhaust region and defines a reactant having an outlet end associated with the exhaust region and an inlet end. The Office is interpreting the arrow below the arrow 22 in Fig. 3 as the exhaust region and thus, all of the byproducts and any unused reactants that exit the fuel cell assembly exit by way of the inner region (applicant's claim 19).

Regarding claims 14-16 and 18, the exhaust region defines a perimeter (tube 24). The spiral assembly extends outwardly of and more than once around the perimeter of the exhaust region. The reactant path has an outlet/ associated with the exhaust region and an inlet end. The spiral assembly comprises an anode, a cathode and an electrolyte. See fig. 2 and 3.

Regarding claim 14, Montemayor's reactant flows both labeled 34, as well as 22 and 24, meet the limitation "only reactant flow direction is inward toward the housing exhaust port that is located radially inward of the housing inlet". Since Montemayor's housing exhaust port is located radially inward of the housing inlet, all the reactant flows ultimately lead toward the housing exhaust and thus, necessarily flow only inward toward the housing exhaust port.

The Examiner's interpretation of the limitation "only reactant flow direction is inward toward the housing exhaust port that is located radially inward of the housing inlet" is as follows:

To summarize the abovementioned claim limitation, the housing exhaust port is located radially inward of the housing inlet. The reactant flow direction is only inward toward a radially inward port.

Montemayor's housing exhaust port 22 is located radially inward of the housing inlet. The Examiner is interpreting the flow direction of both arrows 34 to meet the limitation direction only inward toward the radially inward port because the limitation "inward" has not been specified as to in which direction, and is not limited to "radially inward" direction. The flow direction of both arrows 34, and thus Applicant's arrows B and C, point toward the inward of the fuel cell 28, and not outward, and thus meets the limitation "only ... inward toward ... the radially inward (port)".

### ***Claim Rejections - 35 USC § 102/103***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 19, 22, and 23 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Montemayor (US 6063517).

Montemayor discloses that the anode/cathode arrangement has a spiral shape that extends more than once around the perimeter of the exhaust region and defines a reactant having an outlet end associated with the exhaust region and an inlet end. The Office is interpreting the arrow below the arrow 22 in Fig. 3 as the exhaust region and thus, all of the byproducts and any unused reactants that exit the fuel cell assembly exit by way of the inner region.

Montemayor discloses that hydrogen and oxygen are supplied into the hydrogen tubes and the oxygen path. Further, an air or oxygen blower is present to inject the reactant gases. Although Montemayor does not expressly disclose a reactant supply connected to the reactant inlets (applicant's claim 23), a reactant supply must necessarily be present for the hydrogen gas to be flowing through the hydrogen tubes. Should it not be anticipatory, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a reactant supply for the benefit of providing reactant gas to the fuel cell to make the fuel cell operable.

The Examiner notes that Montemayor as disclosed in Fig. 3 meets the limitation "such that all of the byproducts and any unused reactants that exit the fuel cell assembly exit by way of the inner region". The Examiner notes that Montemayor's configuration is functionally equivalent to Applicant's fuel cell assembly as claimed in claim 19.



The Examiner makes a *prima facie* case of equivalence. Factors to be considered are:

- (A) performs the function specified in the claim,
- (B) is not excluded by any explicit definition provided in the specification for an equivalent, and
- (C) is an equivalent of the means- (or step-) plus-function limitation,

Before addressing the factors establishing equivalence, the Examiner notes that the Specification discloses several distinct embodiments, as supported by the Restriction requirement dated 12/9/2005. The Applicants have not specified in the Specification as to which embodiment the means-plus-function refers to. Furthermore, the Applicants have not excluded any definitions that would exclude any structures.

MPEP 2184 I states that:

If no definition is provided, some judgment must be exercised in determining the scope of "equivalents." Generally, an "equivalent" is interpreted as embracing more than the specific elements described in the specification for performing the specified function, but less than any element that performs the function specified in the claim.

The Examiner notes that solely the drawing cannot be relied upon to exclude limitations, absent specific definitions supported by the Specification.

In light of the above comments, the following factors are addressed:

**Addressing factor A**

Montemayor's outlet reactants all exit by the inner region, as claimed by the Applicants. The Examiner notes that Montemayor's exit flows performs the identical function specified in claim 19 in substantially the same way, and produces substantially the same results, in that all the reactant flow ultimately exits by the way of the inner region.

Prior art is an equivalent if " the prior art element performs the identical function specified in the claim in substantially the same way, and produces substantially the same results as the corresponding element disclosed in the specification. *Kemco Sales, Inc. v. Control Papers Co.*, 208 F.3d 1352, 54 USPQ2d 1308 (Fed. Cir. 2000)

**Addressing factor B**

The Examiner notes that a person of ordinary skill in the art would have recognized the interchangeability between Montemayor and the Applicant's invention because it does not affect the reactant flow path. The only difference between Montemayor and the Applicant's invention is that in Montemayor, the reactant exits at two locations and Applicant's reactant exits at one location at the inner assembly once the reaction has been completed. Either configuration would allow for the reactant to exit at the inner assembly.

**Addressing factor C**

The Examiner notes that prior art is an equivalent if "(t)he limitation in a means-plus-function claim is the overall structure corresponding to the claimed function. The individual components of an overall structure that corresponds to the claimed function are not claim limitations. Also, potential advantages of a structure that do not relate to the claimed function should not be considered in an equivalents determination under 35 U.S.C. 112, sixth paragraph).

**Addressing factor D**

This factor has been addressed by factors (A)-(C).

Should Montemayor not be anticipatory, the Examiner notes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the reactant outlet to solely the inner region for the benefit of simplifying the reactant exit flow.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Montemayor (US 6063517) as applied to claim 19 above and incorporated herein, in view of Wattelet (US 2003/0011721).

Montemeyor discloses all the limitations of claim 19. Although Montemayor does not disclose a heat exchanger associated with the housing and connected to the exhaust port, Wattelet discloses a fuel cell with an integrated heat exchanger unit. The integrated heat exchanger unit exchanges heat with the air outlet to cool the fuel cell ([0008] and fig. 1). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add an integrated heat exchanger unit to the cathode exhaust for the benefit of cooling the fuel cell.

### ***Suggested Claim Language***

It appears that the following suggested claim language would avoid prior art Montemayor: "wherein the fuel path is in the form of a hollow region bound by (or defined by) surfaces of two radially spaced electrodes."

### ***Response to Arguments***

Applicant's arguments have been addressed in the previous Office Action mailed 3/23/2007 and the Advisory Action mailed 5/1/2007.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's trainer, Susy Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ckl

Cynthia Lee

Patent Examiner

A handwritten signature in black ink, reading "Susy Tsang-Foster". The signature is written in a cursive, flowing style with a horizontal line extending from the end.

SUSY TSANG-FOSTER  
SUPERVISORY PATENT EXAMINER